

**VIBRATIONAL REDUCTION SYSTEM  
FOR AUTOMOTIVE VEHICLES**

**ABSTRACT**

5           A vibration reduction and damping system for use in automotive closure  
panels, such as doors, lift gates, or other operable hatches comprising an intrusion  
device and an expandable material, such as a polymer-based foam, disposed along  
at least a surface of the intrusion device prior to final assembly of the vehicle by the  
vehicle manufacturer. The system is activated as the vehicle undergoes the final  
10 vehicle assembly process, which activates and transforms the expandable material,  
preferably during an automobile paint operation, to expand, bond and fill the door  
assembly structure for vibrational damping and noise reduction.